

## **Exhibit A**

Revised Filing:

- Copy of the Amendment Cover Letter- previously filed on August 23, 2007
- Copy of the Request for Extension of Time under 37 C.F.R. § 1.136 for Three-Months- previously filed on August 23, 2007
- Amendment under 37 C.F.R. § 1.111-Revised Version

Docket No. 282736US8X  
IN RE APPLICATION OF: Frederic KAPLAN  
SERIAL NO: 10/680,006  
FILED: October 7, 2003  
FOR: ADAPTIVE ARTIFICIAL VISION METHOD AND SYSTEM

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:  
Transmitted herewith is an amendment in the above-identified application.

- No additional fee is required  
 Small entity status of this application under 37 C.F.R. §1.9 and §1.27 is claimed.  
 Additional documents filed herewith: Request for Extension of Time (3 Months)

The Fee has been calculated as shown below:

CLAIMS	CLAIMS REMAINING		HIGHEST NUMBER PREVIOUSLY PAID	NO. EXTRA CLAIMS	RATE	CALCULATIONS
TOTAL	16	MINUS	20	0	x \$50 =	\$0.00
INDEPENDENT	3	MINUS	3	0	x \$200 =	\$0.00
APPLICATION SIZE		MINUS	100	(each addtl. 50 sheets)	x \$250 =	\$0.00
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIMS				+ \$360 =	\$0.00	
TOTAL OF ABOVE CALCULATIONS					\$0.00	
<input type="checkbox"/> Reduction by 50% for filing by Small Entity					\$0.00	
					TOTAL	\$0.00

- A check in the amount of \$0.00 is attached.  
 Credit card payment form is attached to cover the fees in the amount of \$1,020.00  
 Please charge any additional Fees for the papers being filed herewith and for which no check or credit card payment is enclosed herewith, or credit any overpayment to deposit Account No. 15-0030. A duplicate copy of this sheet is enclosed.  
 If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time may be charged to Deposit Account No. 15-0030. A duplicate copy of this sheet is enclosed.

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

Copy Previously Filed on August 23, 2007  
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**COPY**

Docket No. 282736US8X

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF: Frederic KAPLAN

SERIAL NO: 10/680,006

GAU: 2624

FILED: October 7, 2003

EXAMINER: LIEW, A. K. S.

FOR: ADAPTIVE ARTIFICIAL VISION METHOD AND SYSTEM

**REQUEST FOR EXTENSION OF TIME  
UNDER 37 C.F.R. 1.136**

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

It is hereby requested that a **three** month extension of time be granted to August 23, 2007 for

- filing a response to the Official Action dated: February 23, 2007.
- responding to the requirements in the Notice of Allowability dated:
- filing the Formal Drawings. The Issue Fee due \_\_\_\_\_ has been timely filed.
- responding to the Notice to File Missing Parts of Application dated:
- filing a Notice of Appeal. A timely response to the final rejection, due \_\_\_\_\_ has been filed.
- filing an Appeal Brief. A Notice of Appeal was filed on:
- Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown below is reduced by one-half.

The required fee of \$1,020.00 is enclosed herewith by credit card payment and any further charges may be made against the Attorney of Record's Deposit Account No. 15-0030. A duplicate copy of this sheet is enclosed.

Respectfully Submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

Copy Previously Filed and Three-Month  
Extension of Time Paid on August 23, 2007

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DOCKET NO: 282736US8X

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :  
FREDERIC KAPLAN : EXAMINER: LIEW, ALEX KOK SOON  
SERIAL NO: 10/680,006 :  
FILED: OCTOBER 7, 2003 : GROUP ART UNIT: 2624  
FOR: ADAPTIVE ARTIFICIAL VISION :  
METHOD AND SYSTEM :

AMENDMENT UNDER 37 C.F.R. § 1.111

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

Responsive to the Office Action of February 23, 2007, please amend the above-identified application as follows:

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks/Arguments** begin on page 9 of this paper.

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Original): An adaptive artificial vision method comprising the following steps:

- (a) defining successive couples of synchronized timesteps ( $t_{-1}, t ; t, t_{+1} ; \dots$ ) such that the time difference  $\tau$  between two synchronized timesteps ( $t_{-1}, t ; t, t_{+1} ; \dots$ ) of a couple of synchronized timesteps is equal to a predetermined time delay  $\tau_0$ ,
- (b) comparing two successive images ( $I_{t-1}, I_t ; I_t, I_{t+1} ; \dots$ ) at each couple of synchronized timesteps ( $t_{-1}, t ; t, t_{+1} ; \dots$ ) spaced by said predetermined time delay  $\tau_0$  for obtaining a delta image  $\Delta_t$  which is the result of the computation of the distance between each pixel of said two successive images ( $I_{t-1}, I_t ; I_t, I_{t+1} ; \dots$ ) in view of characterizing movements of objects between said two successive images ( $I_{t-1}, I_t ; I_t, I_{t+1} ; \dots$ ),
- (c) extracting features from said delta image  $\Delta_t$  for obtaining a potential dynamic patch  $P_t$  which is compared with dynamic patches previously recorded in a first repertory  $R_d$  which is progressively constructed in real time from an initial void repertory,
- (d) selecting the closest dynamic patch  $D_i$  in this first repertory  $R_d$  or if not sufficiently close dynamic patch still exists, adding the potential dynamic patch  $P_t$  to the first repertory  $R_d$  and therefore obtaining and storing a dynamic patch  $D_i$  from the comparison of two successive images ( $I_{t-1}, I_t ; I_t, I_{t+1} ; \dots$ ) at each couple of synchronized timesteps ( $t_{-1}, t ; t, t_{+1} ; \dots$ ), and
- (e) temporally integrating stored dynamic patches  $D_i$  of the first repertory  $R_d$  in order to detect and store stable sets of active dynamic patches representing a characterization of a reoccurring movement or event which is observed.

Claim 2 (Original): A method according to claim 1, wherein when stable sets of active dynamic patches representing a characterization of a reoccurring movement have been detected, the center of the movement is identified and static patches which are at a predetermined distance  $d$  from the movement center and are obtained by a process of static pattern recognition are analyzed to constitute at a given timestep a set of active static patches  $S_i$  which are stored in a second repertory  $R_s$ .

Claim 3 (Original): A method according to claim 2, wherein stored patches  $S_i$  of the second repertory  $R_s$  are spatially integrated in order to detect and store stable sets of active static patches representing a characterization of an object which is recurrently involved in observed known reoccurring movements.

Claim 4 (Currently Amended): A method according to claim 2 or claim 3, wherein the process of static pattern recognition and production of static patches is initiated after stable sets of active dynamic patches representing a characterization of a reoccurring movement have been detected.

Claim 5 (Currently Amended): A method according to claim 2, An adaptive artificial vision method comprising the following steps:

(a) defining successive couples of synchronized timesteps  $(t_{-1}, t; t, t_{+1}; \dots)$  such that the time difference  $\tau$  between two synchronized timesteps  $(t_{-1}, t; t, t_{+1}; \dots)$  of a couple of synchronized timesteps is equal to a predetermined time delay  $\tau_0$ ,

(b) comparing two successive images  $(I_{t-1}, I_t; I_t, I_{t+1}; \dots)$  at each couple of synchronized timesteps  $(t_{-1}, t; t, t_{+1}; \dots)$  spaced by said predetermined time delay  $\tau_0$  for

obtaining a delta image  $\Delta_t$  which is the result of the computation of the distance between each pixel of said two successive images ( $I_{t-1}, I_t ; I_t, I_{t+1} ; \dots$ ) in view of characterizing movements of objects between said two successive images ( $I_{t-1}, I_t ; I_t, I_{t+1} ; \dots$ ),

(c) extracting features from said delta image  $\Delta_t$  for obtaining a potential dynamic patch  $P_t$  which is compared with dynamic patches previously recorded in a first repertory  $R_d$  which is progressively constructed in real time from an initial void repertory,

(d) selecting the closest dynamic patch  $D_i$  in this first repertory  $R_d$  or if not sufficiently close dynamic patch still exists, adding the potential dynamic patch  $P_t$  to the first repertory  $R_d$  and therefore obtaining and storing a dynamic patch  $D_i$  from the comparison of two successive images ( $I_{t-1}, I_t ; I_t, I_{t+1} ; \dots$ ) at each couple of synchronized timesteps ( $t_{-1}, t ; t, t_{+1} ; \dots$ ), and

(e) temporally integrating stored dynamic patches  $D_i$  of the first repertory  $R_d$  in order to detect and store stable sets of active dynamic patches representing a characterization of a reoccurring movement or event which is observed,

wherein when stable sets of active dynamic patches representing a characterization of a reoccurring movement have been detected, the center of the movement is identified and static patches which are at a predetermined distance  $d$  from the movement center and are obtained by a process of static pattern recognition are analyzed to constitute at a given timestep a set of active static patches  $S_i$  which are stored in a second repertory  $R_s$ , and wherein the process of static pattern recognition and production of static patches is initiated at the same time as the process of dynamic movement recognition and production of dynamic patches and when stable sets of active dynamic patches representing a characterization of a reoccurring movement have been detected, the process of static pattern recognition is

continued exclusively with static patches which are located in a restricted area of the image which is centered on said identified movement center.

Claim 6 (Currently Amended): A method according to claim 1, wherein during the computation of the distance between each pixel of two successive images ( $I_{t-1}, I_t$ ), a filter function  $f_{th}$  is used to keep only the most significant differences and therefore obtain a delta image  $\Delta_t$  such that

$$\Delta_t = f_{th}(\|I_{t+1} - I_t\|) \quad \underline{\Delta_t = f_{th}(\|I_t - I_{t-1}\|)}$$

Claim 7 (Original): A method according to claim 6, wherein the filter function  $f_{th}$  is a threshold function.

Claim 8 (Currently Amended): A method according to ~~any one of claims 1 to 7~~ claim 1, wherein the step of extracting features from the delta image  $\Delta_t$  comprises computing a gaussian color model of the distribution for each color component.

Claim 9 (Currently Amended): A method according to ~~any one of claims 1 to 7~~ claim 1, wherein the step of extracting features from the delta image  $\Delta_t$  comprises using histograms to model the distribution for color components, shape or texture.

Claim 10 (Currently Amended): A method according to ~~any one of claims 2 to 5~~ claim 2, wherein static patches are obtained on the basis of salient points  $(x,y)$  in an image  $I_t$  provided at a synchronized timestep  $t$  when a salient point  $(x,y)$  is detected, a region  $R_{x,y}$

corresponding to the surrounding pixels is defined and features are extracted from this region  $R_{x,y}$  to define a potential static patch  $S_{x,y}$ .

**Claim 11 (Original):** A method according to claim 10, wherein the extraction of features from the region  $R_{x,y}$  comprises measuring the color change of a pixel compared to its neighbors and computing a color model of the color distribution in the region  $R_{x,y}$ .

**Claim 12 (Currently Amended):** A method according to ~~any one of claims 1 to 11~~ claim 1, wherein successive steps of synchronized timesteps ( $t_{-1}, t ; T, T_{+1} ; \dots$ ) are separated by a period of time  $T$  which is equal to  $\underline{n}$  times the predetermined time delay  $\tau_0$ , where  $\underline{n}$  is an integer which is positive or equal to zero.

**Claim 13 (Original):** A method according to claim 12, wherein successive couples of synchronized timesteps ( $t_{-1}, t ; t, t_{+1} ; \dots$ ) are contiguous without any time interruption between two successive couples of synchronized timesteps ( $t_{-1}, t ; t, t_{+1}$ ).

**Claim 14 (Currently Amended):** A method according to ~~any one of claims 1 to 13~~ claim 1, wherein it further comprises the step of detecting transitions between stable sets of active dynamic patches representing a characterization of reoccurring movements and of constructing transition graphs for predicting complex events comprising a sequence of identified movements.

**Claim 15 (Currently Amended):** An adaptive artificial vision system comprising:

- a clock [[(101)]] for defining successive couples of synchronized timesteps ( $t_{-1}, t; t, t_{+1}; \dots$ ) such that the time difference  $\tau$  between two synchronized timesteps ( $t_{-1}, t; t, t_{+1}; \dots$ ) of a couple of synchronized timesteps is equal to a predetermined time delay  $\tau_0$ ,

- inputting means [[(102)]] for inputting images ( $I_{t-1}, I_t; I_t, I_{t+1}; \dots$ ) provided by a camera [[(103)]] at said synchronized timesteps ( $t_{-1}, t; t, t_{+1}; \dots$ ),

- first comparator means [[(104)]] for comparing two successive images ( $I_{t-1}, I_t; I_t, I_{t+1}; \dots$ ) inputted at each couple of synchronized timesteps ( $t_{-1}, t; t, t_{+1}; \dots$ ) spaced by said predetermined time delay  $\tau_0$  for obtaining a delta image  $\Delta_t$  which is the result of the computation of the distance between each pixel of said two successive images ( $I_{t-1}, I_t; I_t, I_{t+1}; \dots$ ),

- first memory means ( $M_d$ ) for storing dynamic patches  $D_i$  representing elementary visual parts for describing characterized movements of objects,

- feature extraction means [[(105)]] for extracting features from said delta image  $\Delta_t$  and producing a potential dynamic patch  $P_t$ ,

- second comparator means [[(106)]] for comparing a potential dynamic patch  $P_t$  which is compared with dynamic patches previously recorded in said first memory means ( $M_d$ ),

- selection means [[(107)]] for selecting the closest dynamic patches  $D_i$  in the first memory means ( $M_d$ ) or if no sufficiently close dynamic patch still exists, for recording the potential dynamic patch  $P_t$  into the first memory means so that a dynamic patch  $D_i$  is stored in the first memory means for each comparison of two successive images ( $I_{t-1}, I_t; I_t, I_{t+1}; \dots$ ) at each couple of synchronized timesteps ( $t_{-1}, t; t, t_{+1}; \dots$ ),

- first temporal integrations means [[(108)]] comprising computing means [[(108A)]] for computing during a time  $T_{F1}$  corresponding to a predetermined number  $N1$  of couples of

synchronized timesteps the frequency of each dynamic patch  $D_i$  stored in the first memory means and threshold means [[(108B)]] for defining a set of active dynamic patches comprising dynamic patches  $D_i$  whose frequency is higher than a predetermined threshold, and,

- second temporal integration means [[(107)]] comprising computing means [[(109A)]] for computing during a time  $T_{F2}$  corresponding to a predetermined number  $N_2$  of couples of synchronized timesteps the frequency of each set of defined active dynamic patches and threshold means [[(109B)]] for defining a stable set of dynamic patches corresponding to a reoccurring movement for each set of active dynamic patches whose frequency is higher than a predetermined threshold.

Claim 16 (Currently Amended): A system according to claim 15, wherein it further comprises means [[(110)]] for identifying the center of a reoccurring movement represented by a stable set of active dynamic patches and means [[(111)]] for triggering static pattern recognition [[(112)]] for analyzing static patches which are at a predetermined distance  $d$  from said center of a reoccurring movement.

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested. Claims 1-16 are pending, Claims 4-6, 7-10, 12, 14, 15 and 16 having been amended by way of the present amendment.

In the outstanding Office Action Claims 6 and 7 were objected to as containing informalities; Claim 5 was objected to as being dependent upon a rejected base claim, but otherwise contains allowable subject matter; Claims 1 and 12-14 were rejected as being unpatentable over Cohen (U.S. Patent No. 6,681,031) in view of Dobashi (U.S. Patent Publication No. 2002/0126880); Claims 2-4, 10, 15 and 16 were rejected as being unpatentable over Cohen in view of Dobashi and in further view of Bongiovanni (U.S. Publication No. 2005/0041102); Claims 6 and 7 were rejected as being unpatentable over Cohen in view of Dobashi and in further view of Banh (U.S. Patent No. 5,150,426); Claims 8 and 9 were rejected as being unpatentable over Cohen in view of Dobashi and in further view of Kim (U.S. Patent No. 6,999,604); and Claim 11 was rejected as being unpatentable over Cohen in view of Dobashi, Bongiovanni and in further view of Kim.

In reply, Applicants first would to thank the Examiner for identifying allowable subject matter. Claim 5 has therefore been written in independent form and is believed to be in condition for formal allowance. The informality identified in Claim 6 has been corrected by way of the present amendment. Therefore it is believed that the objections to Claims 6 and 7 has been overcome.

Claim 1 is directed to an adaptive artificial vision method that, among other things, includes steps (c) extracting features from said delta image  $\Delta_t$  for obtaining a potential dynamic patch  $P_t$  which is compared with dynamic patches previously recorded in a first repertory  $R_d$  which is progressively constructed in real time from an initial void repertory, and (d) selecting the closest dynamic patch  $D_i$  in this first repertory  $R_d$  or if not sufficiently

close dynamic patch still exists, adding the potential dynamic patch  $P_t$  to the first repertory  $R_d$  and therefore obtaining and storing a dynamic patch  $D_t$  from the comparison of two successive images ( $I_{t-1}, I_t ; I_t, I_{t+1} ; \dots$ ) at each couple of synchronized timesteps ( $t_{-1}, t ; t, t_{+1} ; \dots$ ).

Thus, a repertory is initially void and a first repertory  $R_d$  is progressively constructed in real time. In contrast, in Cohen a predetermined number of gestures are identified and the different types of gestures are divided in different lines. Cohen provides an initial repertory which is not void and is progressively constructed in real time.

According to Cohen, a reference database includes a limited number of patches corresponding to a limited number of stereotype gestures (see Abstract “Feature position measure is used in conjunction with a bank of predictor bins seeded with the gesture parameters, and the system determines which bin best fits the observed motion.”).

As acknowledged in the outstanding Office Action, according to Cohen, in the identification process, a closest gesture in the reference bins will be selected and if there is none, then no gesture is identified (column 21, lines 54-64). Cohen thus discloses a non-flexible system which needs a preliminary identification of specific gestures and cannot be further expanded during a recognition process. This is a very substantial difference with respect to the subject matter defined by Claim 1.

Dobashi cannot reasonably be combined with Cohen because Dobashi relates to a face image recognition apparatus and a face image can hardly be defined as a recurring movement or element. Moreover, contrary to step c) in Claim 1, Dobashi requires a preset registration procedure (see page 6 [0090]) and cannot start with a void register. Furthermore, when a new reference feature amount is registered into the registration information holding section ([0086]), such new reference feature is considered as being a second class type of information ([0090]) “the old registration information is a feature amount registered by use of a preset

registration procedure and is highly worth holding and the new registration information is a feature amount extracted in the course of the recognition process and is less worth holding"). Accordingly, there is no incentive for a person of ordinary skill in the art to combine Dobashi and Cohen. Nevertheless, whether taken individually or in combination, neither Cohen nor Dobashi teach or suggest the claimed method since neither Dobashi or Cohen starts from a void register. Consequently it is respectfully submitted that Claim 1 patentably defines over Cohen in view of Dobashi.

Claims 2-4 and 6-14, as amended, all depend from Claim 1. Thus it is believed that these claims also patentably define over the asserted prior art.

Claim 15 relates to a corresponding system and therefore is of a different statutory class. But nevertheless, Claim 15 requires "selection means for selecting the closest dynamic patch  $D_i$  in the first memory means or if no sufficiently close dynamic patch still exists, for recording the potential dynamic patch  $P_t$  into the first memory means." As discussed above with regard to Claim 1, Cohen describes a non-flexible system which needs a preliminary identification of specific gestures and cannot be further expanded during a recognition process. Dobashi does not cure this deficiency because it does not disclose particular memory means specifically adapted for storing dynamic patches representing elementary visual parts for describing characterized movements of objects. Thus it is respectfully submitted that no combination of Cohen in view of Dobashi teaches or suggests all the elements of Claim 15. Because Claim 16 depends from Claim 15 it is respectfully submitted that Claim 16 also patentably defines over the asserted prior art.

Consequently, in view of the present amendment and in light of the foregoing comments, it is respectfully submitted that the invention defined by Claims 1-16, as amended, is patentably distinguishing over the prior art. The present application is therefore believed to

Application No. 10/680,006  
Reply to Office Action of February 23, 2007

be in condition for formal allowance and an early and favorable reconsideration of this rejection is therefore requested.

Respectfully submitted,

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